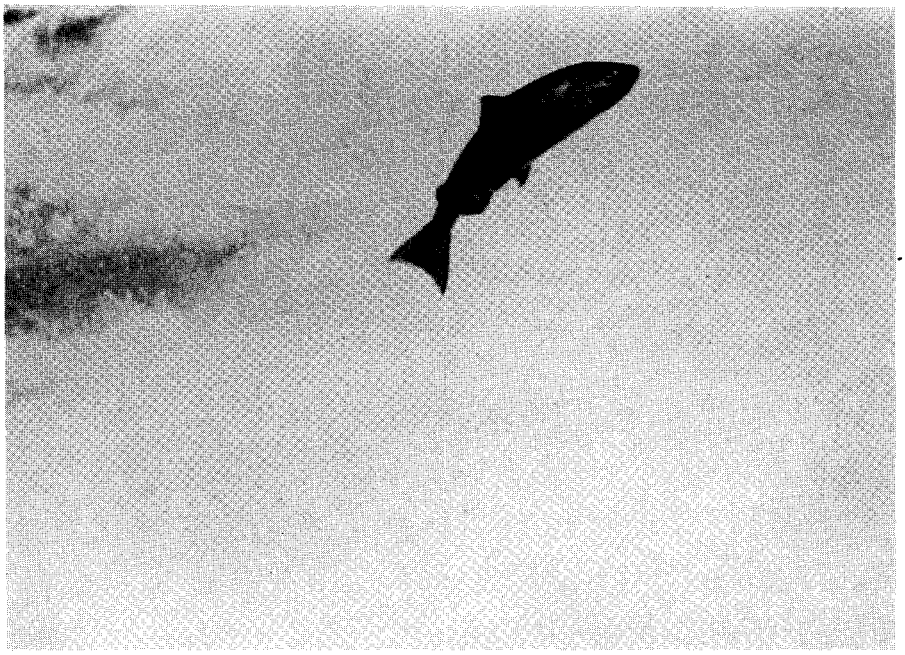
Volume 071
Article 06

FISHERY RESEARCH

FEDERAL AID
IN
FISH RESTORATION

FISH HATCHERY EVALUATIONS – IDAHO

Performed for U.S. Department of the Interior
Fish and Wildlife Service, Contract No. 14-16-0001-8605
Lower Snake River Fish and Wildlife Compensation Plan



Robert L. Rohrer
Senior Fishery Research Biologist

December 1986

TABLE OF CONTENTS

LIST OF TABLES

LIST OF TABLES CONTINUED

LIST OF FIGURES

APPENDICES

ABSTRACT

Construction is underway on Magic Valley Steelhead Hatchery and work will begin on the proposed Clearwater Hatchery in 1987.

A total of 970,348 summer chinook smolts (brood year 1984) from McCall Hatchery were released into the South Fork Salmon River in the spring of 1986. Dworshak National Fish Hatchery released 741,306 spring chinook salmon in 1986. Outplants of steelhead smolts from Hagerman National Fish Hatchery totaled 1,577,334 in 1986. In addition, 274,108 excess steelhead were outplanted. In 1986, 333,742 spring chinook salmon smolts were released at Sawtooth Hatchery and 108,679 chinook salmon smolts were planted at the East Fork trap.

Adult steelhead returns to Sawtooth Hatchery numbered 2,212 in 1986; 1,056 fish were released above the trap. Total returns to the East Fork trap were 443 steelhead. In addition, 277 B-run steelhead were transplanted from Pahsimeroi Hatchery to the East Fork.

A number of outplant sites or potential sites were inspected in 1986.

Author:

Robert L. Rohrer
Senior Fishery Research Biologist

INTRODUCTION

The United States Congress authorized the Lower Snake River Fish and Wildlife Compensation Plan (LSRCP) in 1976 to mitigate for fish and wildlife losses as a result of Lower Snake River dams. The LSRCP requires that anadromous fish runs be returned to preproject numbers primarily with the aid of fish hatcheries. To date, four LSRCP hatcheries are in operation: McCall Hatchery, Dworshak National Fish Hatchery (DNFH), Hagerman National Fish Hatchery (HNFH) and Sawtooth Hatchery (Fig. 1). Construction is underway on Magic Valley Steelhead Hatchery and work will begin on the proposed Clearwater Hatchery in 1987.

This project provides a documentation of the hatchery rearing programs including: broodstock selection, size of fish reared, time and size at release, on-site research programs and oversight of all operations. This report summarizes releases and returns for spring 1986 (through June 30, 1986) LSRCP hatchery programs.

OBJECTIVES

1. To provide a documentation of the LSRCP funded fish rearing activities in Idaho and the resultant adult returns.
2. To develop and provide an ongoing evaluation of major operational guidelines of LSRCP hatchery activities in Idaho.
3. To provide an oversight of major hatchery operational practices.
4. To coordinate research and management programs with hatchery capabilities.

METHODS

Steelhead Smolt Outplant Monitoring

Length frequency data were collected as time allowed on steelhead smolts at HNFH that were coded wire tagged. This data will yield information on quality of smolts at release time and may shed light on returns of CWT fish.

Outplant sites, or potential sites, were surveyed as time allowed in 1986 to determine: habitat suitability, presence of barriers and general familiarization.

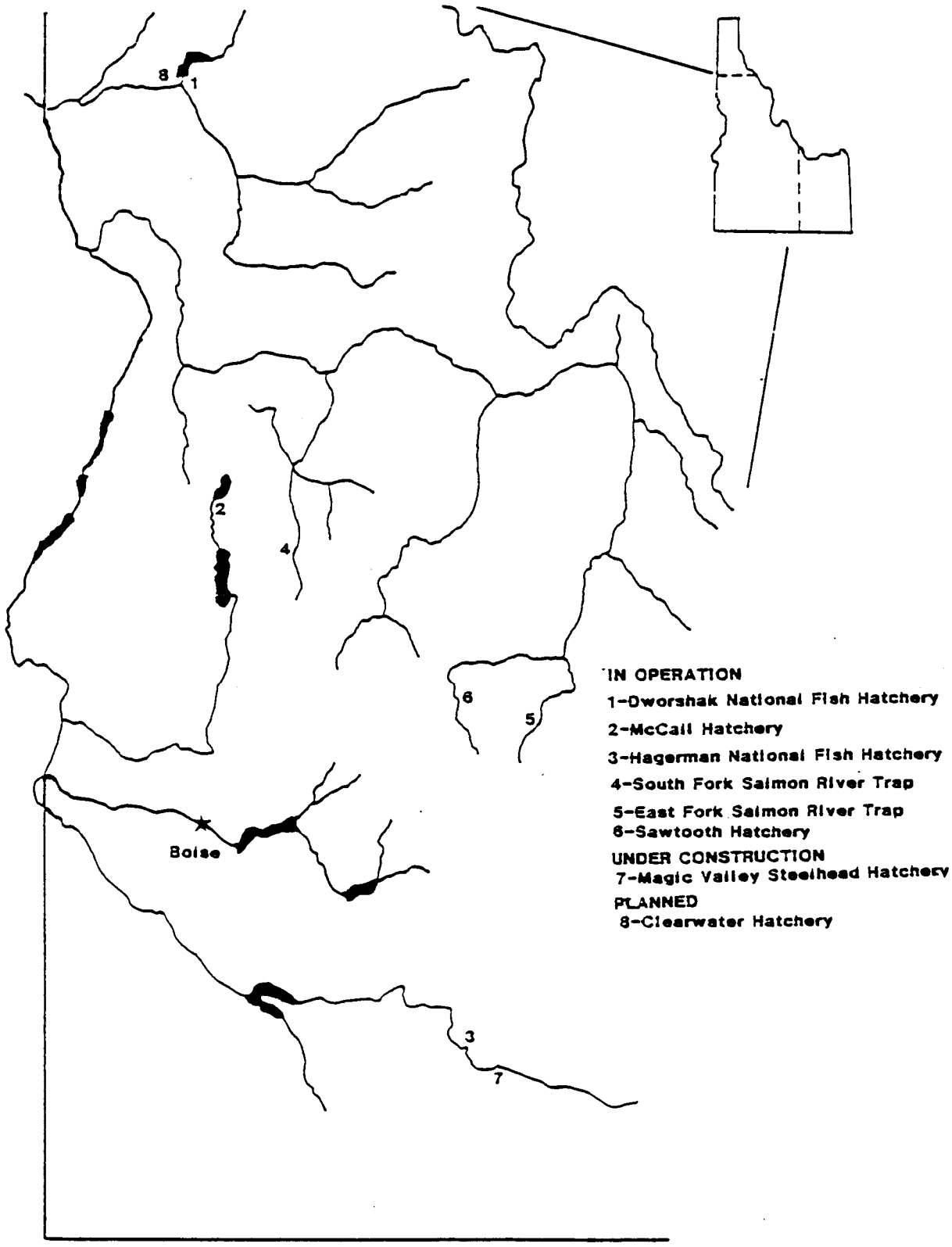


Figure 1. Location of Lower Snake River Compensation Plan facilities in Idaho.

Adult Steelhead Redd Counts

Two streams, Slate and Allison creeks, were sites of steelhead smolt plants in 1983 and 1984 from stock reared at DNFH. Detection of returning adults was made by observing selected areas during spawning periods in the spring of 1986. Dates and times of observations were recorded. Numbers and locations of steelhead redds were also recorded.

Hatchery Oversight

Oversight of hatchery operations was a major project goal in 1986. Hatchery facilities are fully described by Partridge (1984) and Rohrer (1985). Much of the information in this report was provided by hatchery superintendents. In addition, several trips to LSRCP facilities were made in 1985 to 1986 and regular coordination meetings were held annually.

RESULTS AND DISCUSSION

Steelhead Smolt Outplant Monitoring

Length frequency data were collected on five groups of steelhead smolts reared at HNFH (Appendix A.) Mean lengths of CWT groups ranged from 8.0 to 8.7 in.

Outplant sites or potential outplant sites were surveyed as time allowed in 1986.

Hazard Creek

Hazard Creek is the site of outplants of steelhead smolts from HNFH. It enters the Little Salmon River from the east at stream mile 18 and is 8 miles in length (Welsh et al. 1965). On May 5, Hazard Creek was surveyed. A steep gradient limits the potential as a spawning area.

Hard Creek

Hard Creek enters Hazard Creek at stream mile 0.2 and is 10 miles in length. According to Welsh et al. (1965), a total migration barrier is located 0.5 miles above the mouth. The stream contains 16,800 square yards of suitable steelhead spawning gravel and 9,800 yards of suitable spawning area (Welsh et al. 1965). The barrier limits access to only 1,000 square yards for chinook and 800 square yards for steelhead. A barrier removal project could provide access to an additional 16,000 square yards of steelhead spawning area and 8,800 square yards of chinook spawning area. On April 28, one female steelhead was observed about 50 yards from the mouth of Hard Creek. One redd was observed at the mouth of Hard Creek. On May 12, no redds were observed in Hard Creek.

Boulder Creek

Boulder Creek enters the Little Salmon River at river mile 16 and is 16 miles in length (Welsh et al.). Boulder Creek is the site of chinook outplants and habitat evaluation work by Holubetz and Petrosky (1985). A barrier--12 foot falls 4 miles above the mouth--was removed in 1985 and spring chinook were outplanted there in 1986.

We surveyed the stream and looked for spawners on May 15, June 2 and June 6 in 1986. Two adult steelhead were observed about one half mile above the confluence with the Little Salmon River. On May 15, one fish observed was a wild male, possibly a two-ocean fish. No redds or spawning fish were observed at any other time.

Boulder Creek would make a good outplant site for steelhead now that the barrier has been removed.

Elkhorn Creek

Elkhorn Creek enters the Salmon River 100 miles above the mouth and is 8 miles in length. On April 30, Elkhorn Creek was surveyed. The creek has limited spawning potential and no redds or steelhead were noted. A cement water diversion is located about one mile from the confluence and is a barrier to upstream migration.

Lake Creek

Lake Creek enters the Salmon River at river mile 91 and is 9 miles in length. On May 15, no redds or steelhead were observed in the stream. A steep channel gradient limits spawning potential. However, Lake Creek would make a better outplant site than nearby Allison Creek because there is more available spawning gravel.

Skookumchuck Creek

Skookumchuck Creek enters the main stem Salmon River at river mile 58.5 and is 4 miles in length. The creek contains 1,800 square yards of suitable steelhead spawning area and 1,300 square yards of suitable chinook spawning area (Welsh et al. 1965).

We surveyed the creek on May 23, 1986. No redds or adult steelhead were observed; however, observation time was limited.

John Day Creek

John Day Creek is a tributary to the Salmon River in the Riggins area. On May 23, we surveyed the creek and no redds or adults were noted. The creek is small and spawning gravel is somewhat limited. On June 26, we electrofished the stream and captured 23 juvenile rainbow trout (mean = 5.2 in).

East Fork Salmon River

The East Fork Salmon River is located in the Upper Salmon River basin and is the site of a Department fish trap. On May 3, 1986, we surveyed an area below the trap to locate spawning adults; no redds were observed despite reports of spawning activities. Recent high water probably made redd sites unrecognizable. We did see three, large, adult steelhead, probably two-ocean, B-run fish.

Adult Steelhead Redd Counts

Slate Creek and Little Slate Creek

On April 16, 1986, Slate and Little Slate creeks were observed. No steelhead or redds were noted; however, high water made work difficult. On April 18, one redd was noted on Slate Creek about 0.2 miles below Trough Creek. On April 26, one redd was located at the confluence of Little Slate Creek. On May 1, one redd was observed in Slate Creek 1.7 miles above the North Fork. On May 16, a redd was observed 0.3 miles above North Fork Slate Creek. Additional surveys were made on May 22 and 24 and on June 11, 18, 20, 23, 24 and 30 with no redds counted. High water during these periods made counts difficult.

It is our recommendation and intent that further survey work on Slate Creek include a temporary weir at the mouth. More exact counts of adults returning to spawn could be made. In addition, the ratio of hatchery to wild fish could be determined. Currently, lack of access to the stream and poor visibility due to high water during much of the spawning period limit spawning ground surveys. In the future, we will probably rely on weir data to determine run composition.

Allison Creek

On April 15, a pair of spawning steelhead, one-ocean, were observed about 10 m above the bridge near the mouth of the stream. On April 17, a second redd was observed near the site where the spawning steelhead were seen. No redds or steelhead were observed on the following dates: April 20, 23 to 24; May 11, 13, 17 and 19; and June 3, 9, 16, 17 and 20. Spawning activity appears limited in the stream despite outplants of B-run steelhead in 1983 and 1984.

Hatchery Oversight

McCall Hatchery

The McCall Hatchery was the first LSRCP facility completed. Rearing capacity for McCall Hatchery is 1,000,000 summer chinook smolts at 15 to 20/lb at release.

A total of 970,348 (at 21.4 fish/lb) summer chinook salmon were released at Knox Bridge in the South Fork Salmon River from March 24 through 31 in 1986 (Table 1). This is the first full-production release (Appendix B).

Included in the release were coded wire tag groups (CWT) 10/30/12, 10/30/11 and 10/30/10 (105,000 fish/group). A total of 41,600 fish CWT 10/28/12 and 9,185 tag code 10/28/4 were released. Coded wire tag groups were for hatchery evaluation and ocean contribution work. In addition, 43,487 fish with a freeze brand "R.D.Y.3" were planted from CWTs 10/28/12 and 10/28/4.

Dworshak National Fish Hatchery

In 1981, the LSRCP authorized and funded an additional 30 raceways to rear 1,000,000 spring chinook smolts 15 to 20/lb at Dworshak National Fish Hatchery (DNFH).

Dworshak National Fish Hatchery released 741,306 spring chinook salmon in 1986 (Table 2). Escapement was not adequate to obtain enough eggs to fill DNFH. Bill Miller, FAO Biologist, personal communication, estimates that about 1,000 adults will be needed to reach full capacity. Included in this total were 82,925 coded wire tagged fish. As in previous years, those fish released into the North Fork Clearwater River on April 2 to 3 were released after dark.

Hagerman National Fish Hatchery

Hagerman National Fish Hatchery (HNFH) is owned and operated by the U.S. Fish and Wildlife Service. Under LSRCP, the hatchery was rebuilt to rear about 1,700,000 steelhead at 4 to 5/lb (340,000 lb).

Outplants of steelhead smolts at 4.5/lb from HNFH totaled 1,577,334 in 1986 (Table 3). In addition, 274,108 excess steelhead were outplanted (Appendix B). Actual numbers planted each year will vary slightly according to actual size reared to stocking. Capacity is 340,000 lb; this is the primary goal.

Sawtooth Hatchery

At full capacity, Sawtooth Hatchery will produce about 2,200,000 spring chinook (about 25/lb). Sawtooth Hatchery became fully operational in 1985 and is obtaining all goals within restrictions of limited escapement.

Table 1. Release data for McCall Hatchery reared summer chinook salmon (brood year 1984), 1986.

Release site	Release date	Stock	Number	Size (#/lb)	Mean fork length	Marks-reason
Knox Bridge	March 24-31	South Fork	105,981	21.4	4.9	CWT 10/30/12 U.S.-Canada
Knox Bridge	March 24-31	South Fork	105,322	21.4	4.9	CWT 10/30/11 U.S.-Canada
Knox Bridge	March 24-31	South Fork	106,034	21.4	4.9	CWT 10/30/10 U.S.-Canada
Knox Bridge	March 24-31	South Fork	41,600	21.4	4.9	CWT 10/28/12 Hatchery Evaluation
Knox Bridge	March 24-31	South Fork	9,185	21.4	4.9	CWT 10/28/4 Hatchery Evaluation
Knox Bridge	March 24-31	South Fork	602,226	21.4	4.9	

Table 2. Release data for Dworshak National Fish Hatchery reared spring chinook salmon (brood year 1984), 1986.

Release site	Release date	Stock	Number	Size (number/ pound)	Mean fork length	Marks
N. Fk. Clearwater	Apr 2-3	Leavenworth	423,395	20.0	134	
N. Fk. Clearwater	Apr 2-3	Leavenworth	41,850	20.0	134	CWT 10/28/43
N. Fk. Clearwater	Apr 2-3	Leavenworth	41,075	20.0	134	CWT 10/25/20
Snake R. at Lower Granite Dam	Mar 19-31	Leavenworth	164,286	21.4	121	None
Dollar Creek	Apr 25	Rapid River	69,700	231.6[a]		None
Marrowstone Research Facility	Mar 27	Leavenworth	1,000	23.6		None

[a] Brood year 1985.

Table 3. Release data for Hagerman National Fish Hatchery reared steelhead smolts, 1986.

Release site	Release dates	Strain	Number	Size (#/lb)	Marks
Hazard Creek	4/17-30/86	Steelhead "A"	239,595	4.0	
Hazard Creek	4/24/86	Steelhead "A"	35,475	4.4	CWT 10/28/42
Hazard Creek	4/24/86	Steelhead "A"	8,650	4.3	CWT 10/28/5
Hazard Creek	4/24/86	Steelhead "A"	18,583	4.4	
Salmon River @ Sawtooth Hatchery	4/24/86	Steelhead "A"	651,140	4.4	
Salmon River Sawtooth Hatchery	4/24/86	Steelhead "A"	9,450	4.8	CWT 10/28/1
Salmon River @ Sawtooth Hatchery	4/24/86	Steelhead "A"	39,125	4.4	CWT 10/28/44
East Fork Salmon River Fish trap	4/24/86	Steelhead "B"	316,022	4.7	
East Fork Salmon River Fish trap	4/24/86	Steelhead "B"	183,969	4.6	
East Fork Salmon River Fish trap	4/24/86	Steelhead "B"	25,325	4.6	CWT 10/28/20

In 1986, 333,742 chinook smolts were released at Sawtooth Hatchery and 108,679 smolts were planted at the East Fork trap (Table 4). There was not a sufficient return of adult chinook to obtain enough eggs to meet production goals.

Adult steelhead returns to Sawtooth Hatchery numbered 2,212 in 1986 and 1,056 fish were released above the trap (Table 5). Adults returning with CWTs to the Sawtooth trap included: 11 fish with 5/10/28, 31 fish with 5/10/29, 3 fish with 5/13/33 and 1 fish with 5/13/34. Total returns and percent return will be calculated for these tag codes as data is available from the creel surveys. Total returns to East Fork trap were 443 steelhead. In addition, 277 B-run steelhead (79 males and 198 females) were transported from Pahsimeroi Hatchery to the East Fork. Included in the 1986 East Fork trap returns were two steelhead with CWT 5/10/21 and eight fish with tag code 10/24/60.

Table 4. Release data for Sawtooth Hatchery reared chinook salmon smolts, 1986.

Release site	Release dates)	Number	Size (#/Ib)	Marks
Sawtooth Hatchery	March 15	38,300	26.3	CWT 10/28/46
Sawtooth Hatchery	March 15	37,550	26.3	CWT 10/28/45
Sawtooth Hatchery	March 15	257,892	26.3	
East Fork trap	March 18-19	108,679	28.0	

Table 5. Adult return summary for steelhead released by Sawtooth Hatchery, 1986.

Recapture location	Males	Females	Total	1-ocean A's	2-ocean As	B-run fish	Released males	Upstream females
Sawtooth Hatchery	1,271	941	2,212	2,079	116	17	734	322
East Fork trap	266	177	443	184	93	166	305[a]	160[a]

[a]includes Pahsimeroi Hatchery adults released.

ACKNOWLEDGEMENTS

I would like to thank the following people and their staffs for their cooperation, assistance and for the information that they provided:

Wayne Olson, Dworshak National Fish Hatchery
Dave Bruhn, Hagerman National Fish Hatchery
Tom Frew, McCall Fish Hatchery
Bob Moore, Pahsimeroi Fish Hatchery
Tom Rogers, Sawtooth Fish Hatchery
Tim Cochnauer, Anadromous Fish Marking and Recovery

Additional information on the work being done at the separate facilities and projects can be obtained directly from these individuals or their annual reports.

Field work was performed by Jim Chandler. This report was typed by Jodi Rupe and Brenda McDonald.

LITERATURE CITED

Partridge, F. E. 1984. Fish hatchery evaluations-Idaho. Fish and Wildlife Service Contract 14-16-0001-832687. Idaho Department of Fish and Game. Boise, Idaho.

Petrosky, C.E. and T. B. Holubetz, 1985. Idaho habitat evaluation for offsite mitigation record. Annual report 1983, BPA Contract Number DE-A179-84BP13381, Project Number 83-7. Idaho Department of Fish and Game, Boise, Idaho.

Rohrer, R. L. 1986. Fish hatchery evaluations-Idaho. Fish and Wildlife Service Contract 14-16-001-8509. Idaho Department of Fish and Game. Boise, Idaho.

Welsh, T.L., S.V. Gebhards, H.E. Metsker and R.V. Corning. 1965. Inventory of Idaho streams containing anadromous fish including recommendations for improving production of salmon and steelhead. Fish and Wildlife Service Contract 14-19-001-433. Idaho Department of Fish and Game. Boise, Idaho.

APPENDICES

Appendix A. Length frequency data on coded wire tagged groups of steelhead reared at Hagerman National Fish Hatchery, 1986.

Tag code	Release site	Total released	Sample size	Mean length (in)	Standard deviation (in)
10/28/1	Sawtooth Hatchery	9,450	310	8.3	1.9
10/28/44	Sawtooth Hatchery	39,125	310	8.3	1.9
10/28/42	Hazard Creek	35,475	303	8.7	1.2
10/28/5	Hazard Creek	8,700	306	8.7	1.2
10/28/20	East Fork	25,325	301	8.0	1.1

Appendix B. McCall Hatchery summer chinook salmon production for the South Fork Salmon River, 1978 to 1986.

Brood year	Number of smolts released	Number per pound	Release dates	Rearing history
1978	124,800	13.0	April 21-23, 1980	Adults trapped at Little Goose Dam and spawned at Rapid River Hatchery. Eggs shipped to Mackay and McCall hatcheries. McCall fish transferred to Mackay due to construction. Fish returned to McCall then released into SFSR
1979	248,926	17.5	April 6-7, 1981	Adults trapped at Lower Granite Dam, spawned at Dworshak NFH, eyed eggs shipped to McCall Hatchery.
1980	122,247	17.8	April 8-10, 1982	About 50Z of the fish were were from adults trapped at Lower Granite Dam and spawned at Dworshak NFH, eyed eggs transferred to McCall. The rest were from fish spawned at the SFSR facility and shipped to McCall Hatchery.
1981	183,896	20.3	April 4-7, 1983	Adults trapped and spawned at SFSR facility; eggs and fish reared at McCall Hatchery.
1982	69,880	15.6	April 9-11, 1984	Same as 1981.
1983	564,405	19.1	April 1-4, 1985	Same as 1981.
1984	970,348	20.1	March 24-31, 1986	Same as 1981.

Appendix C. Excess steelhead fry released by Hagerman National Fish Hatchery, 1985 to 1986.

Release site	Release dates	Strain	Number	Size (#/lb
Salmon River at Riggins	12/10/85	Steelhead A	91,688	17.2
Salmon River at Riggins	1/7/86	Steelhead A	125,587	10.5
Snake River at Hells Canyon	11/5/85	Steelhead A	56,833	19.4

Submitted by:

Robert L. Rohrer
Senior Fishery Research Biologist

Approved by:

IDAHO DEPARTMENT OF FISH & GAME

Jerry M. Conley, Director

David L. Hanson, Chief
Bureau of Fisheries

Virgil Moore
Fishery Research Manager